INDIANA OFFICE OF
ENERGY & DEFENSE
DEVELOPMENT

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BioCollaboration
Business Plan

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BIO COLLABORATION HIGH LEVEL BUSINESS PLAN

The Bio Collaboration focus area is the creative collaboration between the Bio/Life Sciences and Military/Homeland Defense assets in Indiana to support the challenges of the Military and Homeland Defense. This focus area capitalizes from the intellectual, business, organizational, and branding assets that have been built up in Indiana over the recent past to where Indiana is now ranked among the top five states in the Bio/Life Sciences. Not only does the business of the Defense Assets customer set add to the justification for new bio/life sciences products, services, and infrastructure but their problem set when solved by Indiana's teams will add to the competitiveness of Indiana in bio/life sciences and assure the future.

DETAILED DESCRIPTION:

Current military challenges, which may be addressed, include:

- Rehabilitating and returning the war fighter to combat involving Life Sciences such as neurology, orthopedics, hematology, and psychology.
- Protecting the war fighter against the impact battlefield injuries through biological approaches such as pain control, trauma/impact assessment, and quick counter responses to wounds
- Analyzing the performance of the warfighter in real time monitoring through sensor vests, helmets, and other apparel) as well as using outcomes data to predict and enhance performance prior to and during an engagement
- Sensing chemical, biological, and radiation agents, specifically, the potential use of CBRNE weapons in response or by accidental discovery
- Quick response to diseases caused by a biological attack
- Equivalent challenges exist for the first responder, border patrol (land and sea) and citizen populations. Such capabilities as incoming package/person scanning and early detection of attack (e.g., Bio Shield for the food supply) in addition to those of the above paragraph are examples.

Knowledge assets needed in this focus area are: Neurosciences, Orthopedics, Chemical Analysis, Bio Sensing, Mass Spectrometry, Pharmaceutical Manufacturing, Systems Biology, Complex Systems, and Grid Computing.

A synergistic effect will more than likely occur between Defense Assets, Bio-Crossroads, and the Advanced Manufacturing/Logistics Initiative.

IMPORTANCE FOR INDIANA TO FOCUS AND COLLABORATE ON BIO COLLABORATION

A large amount of money is spent by DOD and Homeland Security in the area of biotechnology and life sciences for items such as:

- Treatment of combat troops, first responders, civilian populations, veterans, and non-combat personnel
- DOD is the largest healthcare customer in the world. It brings much needed and appreciated assets to world calamities, such as to relieve the impact of earthquakes and tsunami's
- Building sensor networks to detect and defend against chemical, biological, radiological, and nuclear attack
- Training of medical personnel

Because of the volume of casualties, their unique conditions, extreme nature of the environment, and importance attached to rehabilitation, the problems being solved by these customers push the state of science and

technology. Intellectual property, products, and services created to address that market will be in a strong competitive position in the commercial market.

Besides its strong capabilities in biotechnology and life sciences, Indiana can provide talented people coming out of its universities trained in useful areas such as sports medicine, trauma, orthopedic therapy, neurology, hematology, and psychology and drug testing. The quality of life is high but wages are moderately low, a good attraction for expanding or new government medical facilities.

As Bio-Crossroads has shown collaboration among the stakeholders is essential in solving the tough problems raised by these customers. Stakeholders in this focus area of the state are collaborative within Indiana, but the need is to collaborate outside the state to maximize the value proposition for these customers.

Table 32 below indicates the extent of the Bio/Life Sciences assets in Indiana that can address military and homeland security opportunities. These assets are very strong and range from academic institutions clustered around IU Medical School, Purdue, IUPUI, and Notre Dame to large companies (pharmaceuticals, orthopedics, and hospitals) to major research centers and a range of small companies involved in chemical and biological sensing, neurological treatment devices, and drug manufacturing equipment.

This focus area can augment the Muscatatuck Urban Warfare Center by training units in new procedures and devices in parallel with urban training exercises.

Table 1

INDIANA ASSETS

University	Large Companies	Small Companies		Other
IU Medical School Stark Neurological Research Institute	Eli Lilly	Yinnel Tech	2K Corporation	INCAPS
IU Medical School Department of Psychiatry	Roche Diagnostics	Andara Life Science	BioVitesse	Inproteo
IN Spinal Cord and Head Injury Research Center	Pfizer	Lafayette Instrument	Prosolia	Indiana Center for Microbiology
PU Agricultural Infrastructure Protection	Dow Agro-Science	Tech Shot	BioStorage	Indiana Biomedical Entrepreneur Network
PU Alfred Mann Institute for Biomedical Development	Zimmer	SonarMed	Endocyte	Indiana Health Information Exchange
PU Homeland Security Institute	Biomet	QuadraSpec	HemoCleanse	Local Neuro-Psychologists
PU Center for Impact Science and Engineering	DePuy	Advanced Concepts and Technology	CoLucid Pharmaceuticals	Indy Race experience in products to minimize impact of crashes
PU 'Tricorder' chemical analysis	Griffin Analytical Technologies	Micro systems Technologies	Dow Agra Sciences	*Regenstrief Institute*
IUPUI Signature Center for BioComputing	Clarion Health	Rehab Hospital of Indiana	Physical Logic	
Notre Dame Center for Microfluidics and Medical Diagnostics	Roudebush VA Medical Center for tertiary care			
Notre Dame Interdisciplinary Center for the Study of Biocomplexity				
Notre Dame, PU, and				

IU Complex System Modeling				
Ivy Tech First responder program				
IN Center for Rehabilitation Sciences and Engineering Center				

The following initiatives have been identified by the Indianans already involved in this focus area and suggest immediate action:

- Impact Trauma Solutions Consortium focusing on Neurological, Orthopedic, Psychiatry
- Exemplar university business curriculum for defense related business (e.g., accounting, law, security)
- Personnel pool of university science and engineering talent for SBIR's initiative
- Muscatatuck Bio Solutions for Urban Combat Situations Test Bed
- Study of best practices for establishing an initiative involving the military and homeland security

There is also a crosscut of this focus group with the Defense Electronics and Advanced Military Informatics focus areas.

IN YEAR ONE:

1. Establish a Center for Human Impact Trauma with the following timetable: in the first three months present a proposal to the Army; Six months later funding starts; and three months later center is jump started
2. Statewide team formed to shepherd SBIR's BAA's, … that involve collaborative efforts
3. Sponsor events to discover Indiana assets, opportunities, solicit inquiries and get on bid list with ten bids as a direct result.
4. Use of Muscatatuck for trial of Indiana technologies/prototypes in this focus area, e.g., soldier sensors, simulation of heat
5. Intrastate networking event among Military facilities, University, Small companies, large companies, state NGOs with focus on Bio Collaboration for near term opportunities
6. Bio Sensors Proof-of-Concept Demo Center. Target for first demo: monitor glucose (number one sensor in military need)
7. Assess progress made and lessons learned.
8. Reconvene with larger, broader group with a more defined statement to attract them.
9. *Engage Orthopedic companies in Indiana.*

There is a dependency on entities outside this team to perform the following activities to meet this plan: a state marketing plan and a briefing on this report with the new university presidents and Ivy Tech's new chancellor. The team expects that it will participate in the planning and support for these activities.

IN YEAR TWO:

1. Land a major DOD facility that has $10 to 50 million core funding at a minimum with additional $ as projects start coming in.
2. Spin off companies from the Human Impact Trauma Center.
3. Establish an integrator and Task Force for this target.
4. Have five additional companies that are engaged in this focus area (new or existing).

There is a dependency on entities outside this team to perform the following activities to meet this plan: continual enhancement of a database for locating potential partners and a situation alert system. The team expects that it will participate in the planning and support for these activities.

RECOMMENDED STAKEHOLDER ACTIONS

This focus area will depend on specific actions on the part of stakeholders within the state.[1]

PUBLIC/PRIVATE DEFENSE ASSETS CONSORTIUM

- Facilitate better collaboration (meetings) between commercial companies, between universities, and Federal and State legislators to build relationships, catalyze efforts to address specific initiatives/contract opportunities, and discuss issues.
- Organize national meeting with government program managers and chief technology officers to learn about capabilities needed by DOD and Homeland Security and to familiarize them with Indiana assets.
- Create and manage a program for marketing Indiana as a defense technologies state.
- Provide guidance (how to, best practices) to focus action teams for creating a Center of Excellence.
- Make facilities available (for example, lab space).
- Provide a secure, compartmented intelligence facility (SCIF) for use by this focus area.
- Assist in attracting Angels, VCs, and Strategic Partners for funding Defense Asset related bio/life sciences startups.
- Encourage a business services infrastructure in Indiana that specializes in Defense Assets business.

STATE GOVERNMENT

- Involve the Governor in promoting this focus area.
- Provide education for a small company new to Defense procedures and terms. DOD contracts are requiring a larger portion of works to done by Small and/or Minority owned business.
- Give first-time proposers SBIR proposal preparation assistance.
- Put the 21st Century Fund SBIR matching program on a sustainable basis.
- Institute a quick grant proposal process.
- Own the statewide database of available state assets.
- Staff an advocate in Washington D.C. to help find opportunities in bio/life sciences within DOD and Homeland Security and to promote Indiana generated proposals in this focus area.

INDUSTRY

- Lead the proposal generation activity.
- Include a line item in the R&D budget of the large companies for Defense Assets projects that is a commitment over a number of years.
- (Large companies) staff a SBIR resource.
- (Large companies) provide funding for a large center and help to connect with academia.
- (Large companies) open up assets (such as Intellectual Properties, Facilities) to small companies.
- (Large companies) institute a mentor program to help a small company to do business with them and directly with DOD and Homeland Security.

[1] Some of these actions have been collected across focus areas and will be presented as composite strategic recommendations later in this report. Where they are unique to Bio Collaboration they have more detail.

ACADEMIA

- Provide facilities for writing grants and proposals.
- Staff proposal review committees at DARPA, Science Boards of the armed services, training commands, etc.
- Engage students in industry based problems/pursuits
- Provide education in program management. This is a high priority because of the complexity in working on defense electronics projects.
- Improve the technology transfer process to release more technology for commercialization by commercial state assets without endangering the latter's competitiveness.
- Improve a company's access to university resources through opening up facilities, access to faculty, and faculty loans to business
- Build Bio Hazard facilities at BL3 level.

IMPLEMENTATION PLAN

ORGANIZATION AND SUSTAINABILITY

For ultimate success, this focus area must have some initial wins to show that collaboration is effective and to attract other companies, especially small businesses not yet doing business with the government, into the effort of gaining $ from these customers. This means that the organizational structure has to avoid the heavy handed processes of the past in proceed in a self-organizing network manner.

METRICS

The following parameters are recommended as a source for three to seven vital performance measures:

- Job creation
- Creation of companies
- 25% growth in DOD $ - grants, contracts
- Establishing a major center with $20-50M annual funding in two years

SUMMARY

Bio/life sciences already have a strong position in Indiana, and the scope of opportunity is tremendous due to abundant customer needs. Many proposals and eventual business can be spawned from these needs. It is imperative, however, to collaborate to bring higher revenue and wealth from DOD and Homeland Security business. To be successful, the Bio Collaboration focus action team must achieve the following objectives:

1. Access to a central "consortium" that can manage marketing, the high level customer relationships, centralized infrastructure, a reputation for success, high level state relationships, and growth/renewal.
2. Active, on-going programs to recruit, involve, and assist inexperienced SMEs in obtaining Defense Electronics business.
3. An improved process for getting IP out of Indiana Universities so that it can be commercialized.
4. A partnership of all the players with a strong teaming attitude and knowledgeable leaders acting as catalysts not overlords.
5. Attracting, retaining, and upgrading defense electronics knowledge and tradecraft.